Chapter One
INVENTORY

INVENTORY

INTRODUCTION

The initial step in the preparation of the Airport Master Plan for Sierra Vista Municipal Airport (FHU) is the collection and analysis of pertinent information. As Sierra Vista Municipal Airport is one of 18 military-civilian joint use airports in the U.S., this analysis will include an inventory of existing conditions and facilities at Sierra Vista Municipal Airport/Libby Army Airfield. References will be made to:

- civilian landside facilities, which are city owned and operated;
- joint use facilities which are owned by the military but which are shared by civilians; and
- military landside facilities which are wholly owned and operated by the military, but which benefit civilian users.

Other essential data will be gathered that place the City of Sierra Vista and the Sierra Vista Municipal Airport geographically and within the context of local and regional needs and demands. The inventory will provide a framework for all subsequent evaluations and proposed actions. This compilation of material includes the following:

- Airport setting, including locale, history, jurisdiction, climate, other vicinity airports, and previous studies;
- Physical inventories and descriptions of facilities and services now provided by the airport;
- An overview of existing regional plans and studies to determine their potential influence on the airport master plan;

- Background information pertaining to the City of Sierra Vista, the southeast Arizona region, and Cochise County (analysis which areas also includes descriptions of recent developments which have taken place in the airport environs and plans for future development which may impact the airport, including the *Preliminary Draft Environmental Assessment*, prepared July, 2000); and

- Population and socioeconomic information which indicate the market and possible future development.

This information has been obtained through on-site investigations of the airport and interviews with airport management, airport tenants, representatives of various government agencies, and local and regional economic agencies. Information was also made available through studies concerning the airport, including: the *Sierra Vista Airport Master Plan* (November, 1995), *Preliminary Draft Environmental Assessment for the Transfer and Development of 203 Acres of Property*, (August, 2000), *Sierra Vista Airport-Libby Army Airfield Statistical Data* provided by the city and the Fort Huachuca base commander, and the *U.S. Department of Defense Airfield and Heliport Planning and Design Manual*. City planning and zoning documents were utilized, as well as internet web pages:
www.airnav.com,
www.faa.com,
www.arizonaguide...sierravista.com
www.gcrl.com.

AIRPORT SETTING

The following discussion of setting describes the physical location and historical background of the Sierra Vista Municipal Airport.

LOCATION

The Sierra Vista Municipal Airport is located approximately 70 miles southeast of Tucson, Arizona, 57 miles northeast of Nogales and 35 miles northwest of Bisbee, Arizona. **Exhibit 1A, Vicinity Map** identifies the airport in its regional setting. It is approximately 15 miles from the United States border with the Republic of Mexico. The airport is also situated within the north-central portion of the Fort Huachuca Military Reservation. The airfield is a joint-use facility with Libby Army Airfield. The city-owned, civilian landside facilities are located on approximately 72 acres of land on the north side of the airfield. The civilian landside facilities are under the jurisdiction of the City of Sierra Vista while the airfield and military landside facilities are under the jurisdiction of the U.S. Department of the Army.

The Huachuca Mountains, from which the fort gets its name, are located to the west-southwest of Sierra Vista Municipal Airport. Fort Huachuca was established in 1877 to secure the southern borders of the newly acquired territory. Miller Peak is the highest peak of the Huachucas, rising to 9,466 feet above sea level. Miller Peak is located 12 miles south of the airport. Other mountain ranges located

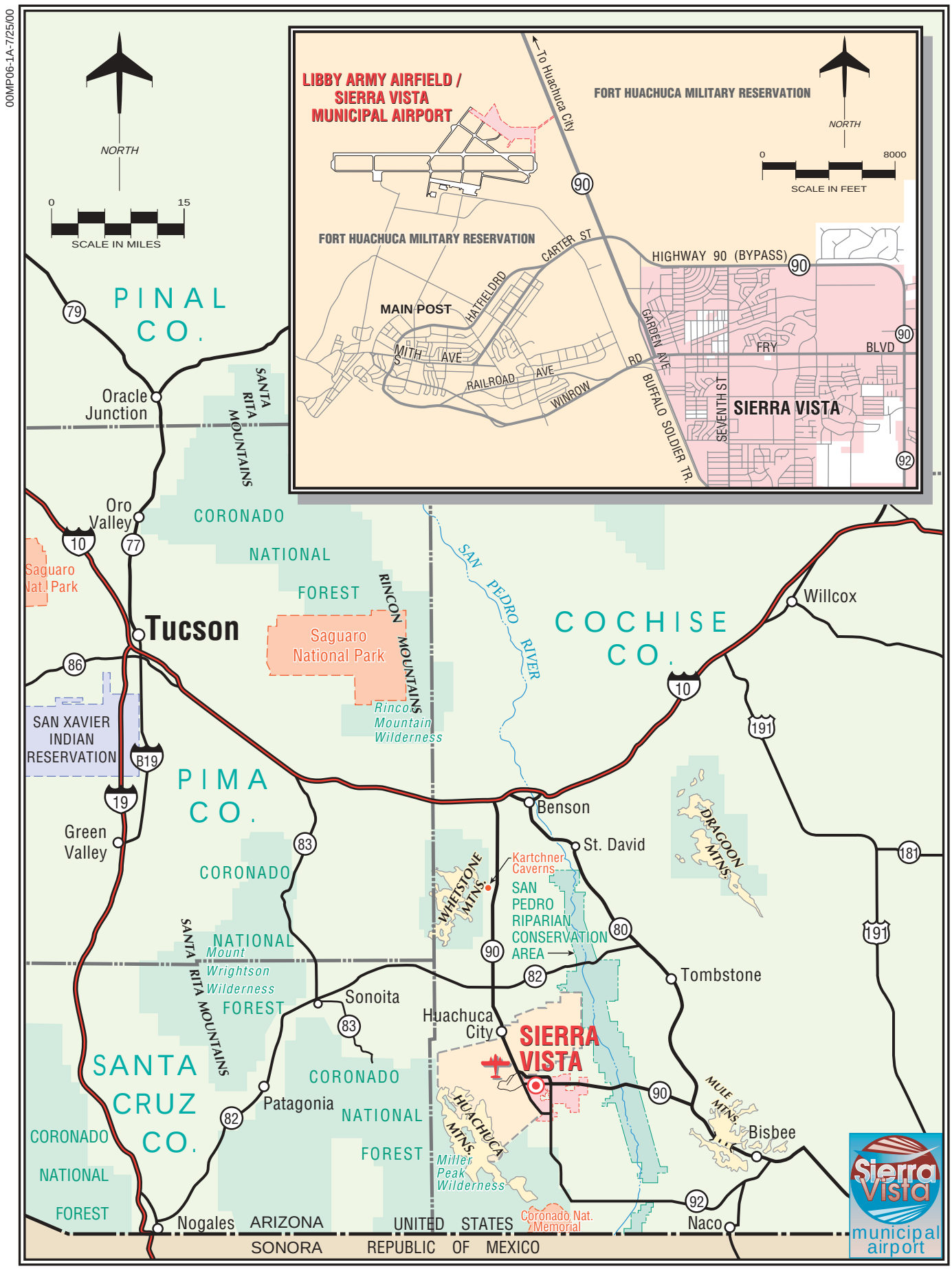


Exhibit 1A
VICINITY MAP

nearby are the Whetstone Mountains to the northwest, the Dragoon Mountains to the northeast and the Mule Mountains to the southeast. The San Pedro River is located approximately six (6) miles east of Sierra Vista and 11 miles east of Sierra Vista Municipal Airport.

AIRPORT JURISDICTION

Currently, Sierra Vista Municipal Airport is maintained under city ownership and management. This civilian airport development began during the early seventies, when the City of Sierra Vista leased a small parcel of land from Fort Huachuca for the purpose of operating a civilian airport at Libby Army Airfield. With federal funding in place, the city acquired the land for civilian aviation development through two deed transfers. The first transferred 29.08 acres of land from the military to the city in 1982. Included in the agreement were the requirements for construction of a terminal facility and an access road. The document also defined the joint use agreement and the degree to which facilities may be shared. In August of 1989 an additional 43.05 acres were deeded to Sierra Vista for the sole purpose of expanding the existing civilian facilities. The airport layout, property boundary, and joint use area delineation are depicted on **Exhibit 1B, Airside Facilities**. A third transfer is pending that would deed an additional 203 acres from the Army for development.

The following conditions are among the primary covenants that regulate civilian use of the land and which are tied to the land under the Joint Use Agreement of 1982:

- The use of the land is limited to public airport purposes.
- The City of Sierra Vista is permitted to improve or alter the existing runways, taxiways, and appurtenances thereto, or to construct new facilities, in accordance with FAA and Department of the Army design specifications.
- Prior to the construction of any improvements on the property, the City of Sierra Vista is required to coordinate the general design of the improvements with the Commander of Fort Huachuca.
- Unless otherwise approved by the Department of the Army, all air traffic in the restricted air space and the air pattern, and on the runways and taxiways at Libby Army Airfield, are under the sole operational control of the Army.
- The City of Sierra Vista is required to maintain security fences around their property in accordance with specifications approved by the Army.
- The City of Sierra Vista is not permitted to construct or allow to be constructed, any facilities at the airport that are within the primary surface without prior approval of the FAA and/or applicable military regulations. The primary surface is defined in the agreement as being

"located on the ground longitudinally centered on the runway with the same length as the runway and having 2,000 feet (1,000 feet either side of the center line of the runway)."

- The Commander of Fort Huachuca may require the City of Sierra Vista to reduce the total volume of water extracted from any well(s) on site to that which is absolutely essential to the operation of the public airport facilities, if it is deemed to be in the best interest of the federal government.

- The City of Sierra Vista is required to provide accommodations to the Civil Air Patrol, Inc. for as long as necessary.

- Unless otherwise approved by the Department of the Army, the City cannot charge landing fees on runways it does not operate or maintain.

CLIMATE

Weather is a critical factor in airport planning and operations. Temperatures determine the length of runway needed for departure. Wind speed and direction determine runway alignment and use. Precipitation affects runway conditions. Cloud cover percentages and frequency of other climatic conditions affect visibility and the need for or use of instrument approaches and airfield lighting.

There is a national weather reporting station located at Libby Army Airfield. This station maintains local wind and temperature data. The climate of Sierra Vista is influenced by its high elevation of 4,716 feet Mean Sea Level (MSL) and the nearby mountains. The average annual precipitation in the area is approximately 15 inches with most of this falling as rain during the July and August monsoon season. The average annual snowfall at Fort Huachuca is 7.4 inches, with the largest amount typically accumulating during December.

July is the hottest month with a mean maximum temperature of near 93 degrees Fahrenheit. Temperatures at the airfield have been recorded as high as 111 degrees (in July) and as low as 8 degrees (in December). The average annual high temperature is approximately 77 degrees while the average annual low is 51 degrees. Humidity in the area averages 40 percent with June being the driest month and August the wettest.

Prevailing winds at Sierra Vista Municipal Airport are primarily out of the west and southwest, favoring the use of Runway 26 and 21. According to the U.S. Air Force ETAC, Air Weather Service, winds at the airport are calm (i.e. 0-5 knots) approximately 30 percent of the time. The average annual wind speed is 5 knots, but is slightly higher in late spring (March through June) and slightly lower in late summer (August through October). The maximum wind speed recorded at Fort Huachuca is 72 knots.

Visibilities below three miles are uncommon in the Sierra Vista area, but may occur due to fog or thunderstorms.

00MP06-1B-6/26/02

FACILITIES :

1. Terminal Building
2. Air Traffic Control Tower (ATCT)
3. Aircraft Rescue and Firefighting (ARFF)
4. Fixed Base Operator (FBO) Hangar
5. Civilian Hangars
6. Small Aircraft Wash Rack
7. Above Ground Fuel Storage Facility
8. Water Storage/Pump Station
9. Military Hangars
10. Air National Guard Complex
11. ATC Offices
12. Water Well Pumping Site
13. Helicopter Pad
14. Civil Air Patrol
15. Large Aircraft Wash Rack & Deicing Station

LEGEND :

- Existing Property Line
- Libby Army Airfield Property Line (Joint Use)

Runway 3-21 4,300' x 75'
Runway 12-30 5,365' x 100'
Runway 8-26 12,000' x 150'
VOR
VASI-4
Localizer Antenna
Localizer
G.S. Antenna
RSU
NDB
Tacan
Main Taxiway
West Ramp
South Ramp
Rotating Beacon
Aero Club Ramp
Main Ramp
Southeast Taxiway
Compass Rose
ASR Radar
A
B
C-1
C-2
D
D-1
D-2
E
F
G
J
K
NORTH
0 1000 2000
SCALE IN FEET

Sierra Vista municipal airport

Exhibit 1B
EXISTING AIRSIDE FACILITIES

According to the U.S. Army, fog occurs at Libby Army Airfield an average of 11 days per year, while thunderstorms occur an average of 61 days per year.

AREA AIRPORTS

There are six public airports and eight private airports within a 40 NM range of the Sierra Vista Municipal Airport. See **Exhibit 1C, Regional Airspace**. Information is given below on those public airfields whose operations parallel those at Sierra Vista. The statistics for Sierra Vista Airport are included for ease of comparison. The following information is included in the table below: associated city, distance from Sierra Vista Municipal Airport, designation within the National Plan of Integrated Airport Systems (NPIAS), longest runway, annual operations, and the number of based aircraft, as obtained from *FAA Terminal Area Forecast System Reports*, December 1999.

Benson Municipal Airport (E95) is classified by the NPIAS as a general aviation airport. Benson is located just south of Interstate 90 and east of State Route 92. The airport's single 4,000-foot runway is paved and improved with lighting. The services provided to itinerant aircraft are tie down service only. As yet no fuel sales are currently available. As the airport opened only recently, there are no based aircraft statistics for 1999.

Nogales International Airport (OLS) is classified as a general aviation airport by the NPIAS. Nogales is equipped with a single 7,199-foot runway. Services offered include Jet A and 100LL fuel sales, charter flights, flight instruction, aircraft rental, and aircraft sales. Statistics for 1999 indicate that there were 28 based aircraft, with 29,200 operations performed on the field annually.

Bisbee Municipal Airport (P04) is classified by the NPIAS as a general aviation airport. The airport is 26 NM southeast of Sierra Vista Municipal Airport. The airport supports one paved runway (5,929 feet in length) and one unpaved runway (2,650 feet). Available services are: 100LL Avgas, hangars and tiedowns. The airfield also has a full time airframe and powerplant mechanical service. Statistics for 1999 indicate that there were ten based aircraft, with 3,016 operations performed on the field annually.

Bisbee Douglas International Airport (DUG) is classified by the NPIAS as a general aviation airport. The airport is 39 NM east-southeast of Sierra Vista Municipal Airport. Bisbee Douglas supports two paved runways 7,311 feet and 7,002 feet in length. Available services are 100LL Avgas, JET-A fuel, hangars and tiedowns, and flight instruction. Major airframe and powerplant mechanical services are offered, in addition to avionics repair. There are 31 based aircraft on the field, with 31,328 annual operations.

Cochise College Airport (P03) is not classified by the NPIAS. The airport is located 35 NM east-southeast of Sierra Vista Municipal. The airfield supports one paved runway 5,303 feet in length. The airfield also has flight training service available. There are fifteen based aircraft and 7,852 annual aircraft operations.

TABLE 1A
Area Airports

Airport/City	Distance nm (from FHU)	Longest Runway	Annual Operations	Based Aircraft
Sierra Vista Municipal Airport	**0**	**12,000**	**69,131**	**40**
Benson Municipal Airport	21	4,000	NA	NA
Bisbee Municipal Airport	26	5,929	3,016	10
Bisbee Douglas International Airport	39	7,311	31,328	31
Cochise College Airport	35	5,303	7,852	15
Nogales Airport	27	7,199	29,200	28
Tombstone Airport	17	4,110	200	0

FAA TAF, December 1999; FAA 5010 Data Area Airports; www.airnav.com; Phoenix Sectional Chart, 65th Edition, June 2000

Tombstone Municipal Airport (P29) Tombstone is not designated within the NPIAS system of airports. According to the Airport/Facility Directory, Runway 6/24 is 4,610 feet in length and has a dirt surface. There are no fuel sales or services, other than tie downs, available. There are no based aircraft at Tombstone. All estimated aircraft operations (200 per year) are itinerant.

OTHER STUDIES

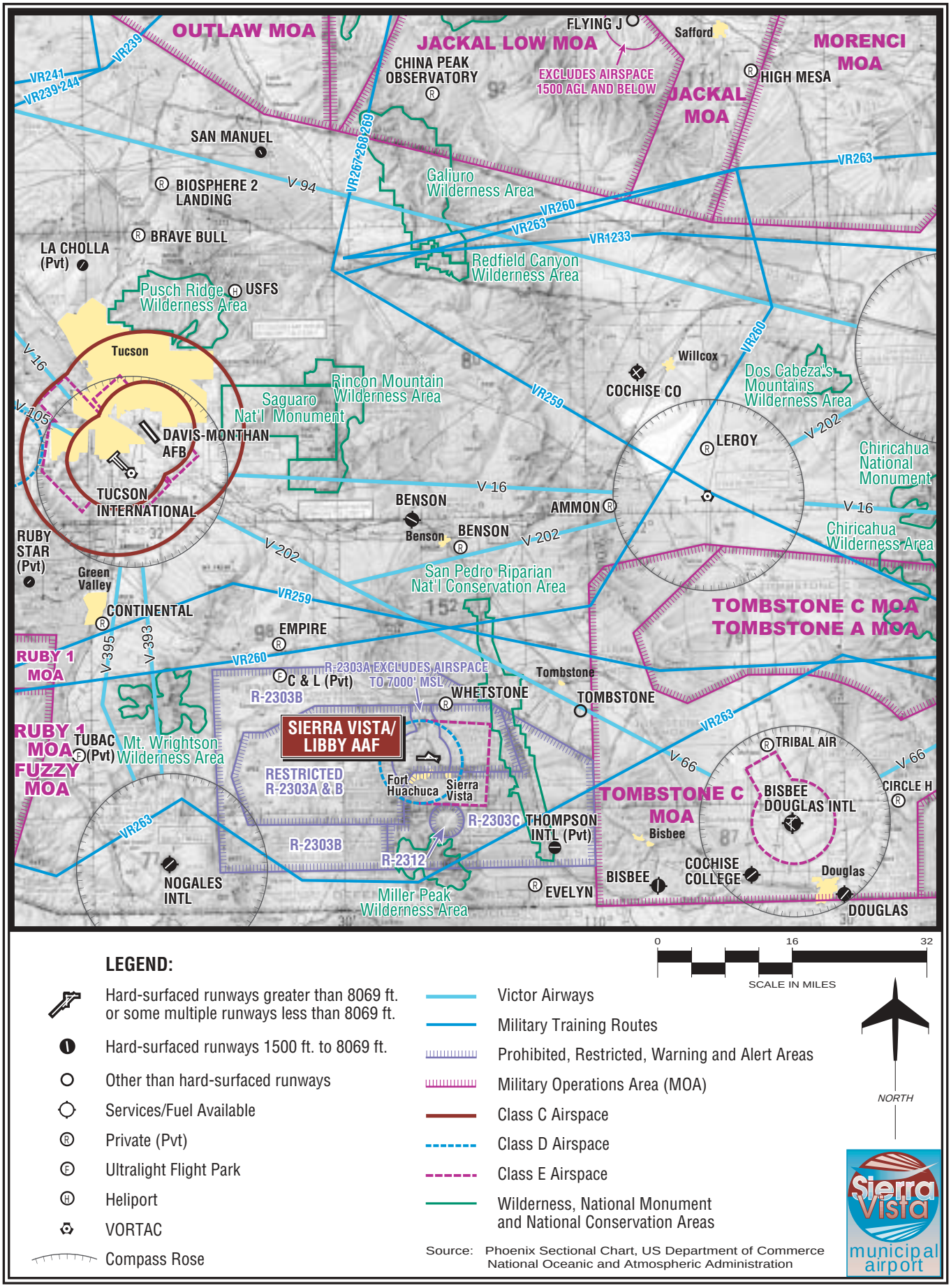
SIERRA VISTA AIRPORT MASTER PLAN

The most recently updated *Sierra Vista Airport Master Plan* (January, 1995) proposed several improvements at the airport to accommodate increased traffic.

The four stage development plan, as depicted in the Airport Layout Plan (ALP), generally recommended the following:

Stage I (1995-2000):
Airside development
- Addition of connector taxiways;
- Construction of a heliport facility;
- Relocation of the VOR;

Landside development
- Construction of T-hangars and conventional hangar facilities;
- Construction of vehicle parking;
- Construction of access roads;
- Construction of a fuel storage area; Expansion of existing general aviation area; and
- Facilities associated with the development of the 203 acres proposed for transfer.



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SCALE IN MILES

NORTH

LEGEND:

- Hard-surfaced runways greater than 8069 ft. or some multiple runways less than 8069 ft.
- Hard-surfaced runways 1500 ft. to 8069 ft.
- Other than hard-surfaced runways
- Services/Fuel Available
- Private (Pvt)
- Ultralight Flight Park
- Heliport
- VORTAC
- Compass Rose
- Victor Airways
- Military Training Routes
- Prohibited, Restricted, Warning and Alert Areas
- Military Operations Area (MOA)
- Class C Airspace
- Class D Airspace
- Class E Airspace
- Wilderness, National Monument and National Conservation Areas

Source: Phoenix Sectional Chart, US Department of Commerce National Oceanic and Atmospheric Administration

Sierra Vista municipal airport

Exhibit 1C
REGIONAL AIRSPACE

Stage II (2001-2005):
Airside development
- Construction of the parallel taxiway;
- Installation of the Precision Approach Path Indicator (PAPI) navigation system; and
- Installation of the Automated Weather Observing System (AWOS).

Landside development
- Construction of T-hangars; Improvements to the access road; and
- Facilities associated with the development of the 203 acres proposed for transfer.

Stage III (2006-2010):
Airside development
- Installation of taxiway lighting;
- Construction of connector taxiways; and
- Expansion of the existing apron.

Landside development
- Construction of T-hangars;
- Expansion of terminal vehicular parking; and
- Facilities associated with the development of the 203 acres proposed for transfer.

Stage IV (2011-2020):
Landside development
- Construction of west apron area;
- Expansion of vehicular parking adjacent to T-hangars;
- Construction of T-hangars; and
- Facilities associated with the development of the 203 acres proposed for transfer.

Some of the proposed improvements stated in the above phases depend upon land acquisition. The 1995 *Airport Master Plan* update identifies the need for and outlines the program for the anticipated acquisition by the city from the Army of 203 acres north and northeast of the existing civilian facilities. The transfer of the property from the Department of the Army would be accomplished as part of an FAA recommended conveyance as described in FAA Order 5190.1, *Transfer of Federal Lands.*

As the initial 72-acre land release to the City of Sierra Vista has been, for all purposes, built out, more land area is needed for the city to be able to develop. The acquired property would allow the airport to meet aviation facilities demands and be financially self-sustaining. This proposed 203-acre acquisition area is currently classified as a Revenue Support Area divided into Aviation-Related Revenue Support and General Revenue Support.

A more detailed land use scenario has been developed for the 203 acres within the Preliminary Draft Environmental Assessment, August, 2000. The general use categories and acreages are: General Aviation Facilities - 60 acres; Aircraft Conversion Facility - 75 acres; Federal Agencies-14 acres; Utilities/ Miscellaneous - 15 acres; Assembly/ Fabrication - 9 acres; Air Cargo/Air Freight - 15 acres; and Natural Drainage Area (Wash) - 15 acres.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS (NPIAS)

Other programs for aviation planning are conducted at the federal and state levels.

Sierra Vista Municipal Airport is classified in the FAA's **National Plan of Integrated Airport Systems (NPIAS)** as a Nonprimary Commercial Service airport. Sierra Vista is one of approximately 125 airports so designated by the NPIAS.

Commercial service airports are defined as public airports receiving scheduled passenger service and having 2,500 or more enplaned passengers per year. There are 540 commercial service airports in the U.S. Of these, 413 have more than 10,000 enplanements and are classified as primary airports. Sierra Vista had previously been designated as a Primary Commercial Service airport, but lost this designation when enplanements fell below 10,000 in 1998. Primary airports receive an annual apportionment in Airport Improvement Program (AIP) funds, with the amount determined by the number of enplaned passengers.

Sierra Vista Municipal Airport also maintains a high general aviation user population. General aviation accounts for the bulk of civil aircraft operations in the U.S. It includes everything from crop dusting to passenger and cargo charter in the largest aircraft.

AIRPORT FACILITIES

This section describes the existing facilities at the Sierra Vista Airport. Facilities are presented as follows:

- Airside Facilities
- Landside Facilities
- Airport Support Facilities

AIRSIDE FACILITIES

Airside facilities include, but are not limited to: runways, taxiways, connecting taxiways, airfield lighting, and navigational aids. Both civilian airside facilities and military airside facilities, that are related to civilian use, are depicted on **Exhibit 1B, Airside Facilities**.

Sierra Vista Municipal Airport has a non-exclusive easement to use the runways and taxiways at Libby Army Airfield. The airside facilities are owned and controlled by Libby Army Airfield, Fort Huachuca. As a military owned facility, it is designed, built and referenced in accordance with Department of the Army requirements, as found in the *Airfield and Heliport Planning and Design Technical Manual, TM 5-803-7*, May 1999. There can be distinctive differences in facility design requirements. For example, the military recognizes runway clear zones which are designed as a rectangle off the ends of the runways. These are the equivalent of civilian runway protection zones which are similarly located, but of differing size.

Runway and Taxiways

Libby Army Airfield currently operates three runways: a primary runway (8-26) and two cross-wind runways (12-30 and 3-21). **Table 1B, Runway Characteristics**, briefly summarizes the runway facilities at Libby Army Airfield.

TABLE 1B
Runway Characteristics

	Runways					
	8	**26**	**12**	**30**	**3**	**21**
Length (feet)	12,000		5,365		4,300	
Width (feet)	150		100		75	
Surface Material	Concrete		Asphalt/Concrete		Asphalt/Concrete	
Pavement Strength						
SWL (lbs)	75,000		46,000		Unknown	
DWL (lbs)	150,000		106,000		Unknown	
DTWL (lbs)	300,000		137,000		Unknown	
DDTWL (lbs)	640,000		172,000		Unknown	
Navigational/Visual Aids						
Runway Markings	Precision		Non-Precision		Visual	
Lighting	HIRL		MIRL		MIRL	
Glide Slope Aids	VASI-4	VASI-4	PAPI-4	PAPI-4	None	None
Runway End Identifier Lights	Yes	Yes	Yes	Yes	No	No
Instrument Landing System	No	Yes	No	No	No	No
Nondirectional Radio Beacon Approach	No	Yes	No	No	No	No
VOR Approach	No	Yes	No	No	No	No
Approach Slope	50:1		40:1		40:1	

Sources: *Airport/ Facility Directory*, U.S. Department of Commerce/National Oceanic and Atmospheric Administration; August 2000. Libby Army Airfield TRAFCON

Runway 8-26 is oriented east-west and is 12,000 feet in length by 150 feet in width. It is constructed of concrete and, according to representatives of the U.S. Army, has been designed to support 75,000 annual operations by a C-141, a

325,000 pound aircraft. A runway of this design is expected to have a weight bearing capacity of 75,000 pounds single-wheel loading (SWL), 150,000 pounds dual-wheel loading (DWL), 300,000 pounds dual-tandem wheel loading (DTWL), and 640,000 pound double-dual-tandem wheel loading (DDTWL). The effective runway gradient is 1.0 percent sloping upward to the west.

Oriented northwest-southeast, Runway 12-30 is 5,365 feet in length, 100 feet in width and is constructed of asphalt-concrete. According to the August 10, 2000, *Department of Commerce/ National Oceanic and Atomospheric Administration, Airport/ Facility Directory*, this runway has a weight bearing capacity of 46,000 pounds SWL, 106,000 pounds DWL, 137,000 pounds DTWL, and 172,000 pounds DDTWL. The effective runway gradient is less than one percent sloping upward to the southeast. (Note: Since the preparation of the 1995 Airport Layout Plan, which identified this runway as 11-29, the magnetic declination has changed, requiring a change in the runway end identifiers.)

Runway 3-21 is oriented northeast-southwest and is also constructed of asphalt-concrete. It is 4,300 feet in length by 75 feet in width. Runway 21 operates with a 1,289-foot displaced threshold, reducing its available runway length to 3,011 feet for landing. This displacement allows for an ultimate 1,000-foot by 3,000-foot Clear Zone. No weight bearing capacity information for Runway 3-21 is included in the *Airport/ Facility Directory*. Its effective runway gradient is 2.1 percent sloping upward to the southwest. (Note: Since the preparation of the Airport Layout Plan, which identified this runway as 2-20, the magnetic declination has changed, requiring a change in the runway end identifiers.)

Taxiway/taxilane systems are provided to facilitate aircraft movement between the runway system and the landside facilities. The existing taxiway system at Sierra Vista Municipal Airport/Libby Army Airfield includes a number of taxiways, including some used exclusively by military aircraft, some by civilian aircraft and some by both.

The majority of the taxiways are 75 feet in width. **Table 1C, Taxiway Characteristics,** describes the name, type, width, and lighting of each taxiway.

AIRFIELD LIGHTING AND MARKING

A variety of lighting and marking aids are available at Sierra Vista Municipal Airport/Libby Army Airfield to facilitate airport identification, approaches, and departures. These systems are categorized by function and are further described in the following sections.

Identification Lighting

The location and presence of an airport is universally indicated by an airport beacon. Civilian airport beacons are equipped with optical systems that project two beams of light: one green and one white. Sierra Vista Municipal Airport/Libby Army Airfield is equipped with a military airport beacon in which

the white light is dual peaked (two quick beams) after the green light. The airport beacon is located on the military side of the airfield.

TABLE 1C
Taxiway Characteristics

Taxiway	Type	Width (feet)	Delineators
Joint Use			
Main Taxiway	Parallel	75	Reflectors
Taxiway A	End (Runway 8)	75	MITL
Taxiway B	Connecting	75	MITL
Taxiway C1	End (Runway 3)	75	MITL
Military Landside Access			
Taxiway C2	Connecting	50	Reflectors
Taxiway D1	Connecting	75	MITL
Taxiway D2	Connecting	75	Reflectors
Taxiway E	Connecting	50	Reflectors
Southeast	End (Runway 30)	50	Reflectors
Taxiway	End (Runway 26	75	MITL
Taxiway F	and Runway 30)		
Civilian Landside Access			
Taxiway D	Connecting	75	MITL
Taxiway G	End (Runway 30)	50	MITL
Taxiway J	Connecting	50	MITL
Taxiway K	End (Runway 21)	75	MITL

Note: MITL - Medium Intensity Taxiway Lighting.
Source: 1995 Sierra Vista Municipal Airport Master Plan, City of Sierra Vista.

The airport is also equipped with five (5) lighted windsocks. One windsock is located between the general aviation and commercial terminal apron. The remaining four windsocks are located on the airfield at the ends of Runways 8, 26, 12, and 3.

Runway and Taxiway Lighting

Runway 8-26 is equipped with High Intensity Runway Lights (HIRLs) which outline the runway with white lights. In addition, red threshold lighting is provided to identify the runway ends. Runway 3-21 and 12-30 are both equipped with Medium Intensity Runway Lights (MIRLs). Threshold lighting is provided to identify the displaced threshold of Runway 3 and the remaining runway ends.

All taxiways to the civilian landside facilities are indicated by Medium Intensity Taxiway Lights (MITLs).

All runway and taxiway lights are pilot controlled when the Airport Traffic Control Tower (ATCT) is closed. This means a pilot can adjust the lights to either low, medium, or high intensity by keying the aircraft microphone.

Approach Lighting

Runway 8-26 is equipped with a four-box Visual Approach Slope Indicator (VASI) system at the approach end of each runway. These systems consist of two-color, high-intensity, focused lights at predetermined angles to provide visual descent guidance information to the pilot during the final approach to the runway. According to the August 2000 *Airport/ Facility Directory*, these VASIs are each set at a 3.0 degree glide angle.

The U.S. Army has installed four-box Precision Approach Path Indicator (PAPIs) lights at the approach ends of Runway 12-30. PAPIs function in a manner similar to VASIs and additionally provide visual descent guidance information. The PAPI-4s for Runway 12-30 are also set at 3.0 degree glide angle.

Runway End Identification Lights (REILs) have been installed on the ends of Runways 8-26 and 12-30. These lights consist of flashing white lights which are located at the runway corners and identify the approach end of a usable runway.

Pavement Markings

Pavement markings are used on runway and taxiway surfaces to identify a specific runway, runway threshold, centerline, hold line, or an edge line. Runways are marked with white markings in accordance with the type of approach available (e.g. visual, nonprecision, or precision) to each runway end. Runway 3-21 is marked with visual approach markings which, in this case, are limited to the runway designation numbers, runway center-line and edge lines. Runway 3 is also marked with a displaced threshold line and aiming point. In addition, each runway blastpad is marked with chevrons. Runway 12-30 is marked with nonprecision runway markings, including threshold markings, aiming point marking, and markings associated with visual runway markings as noted above. Both ends of Runway 8-26 are marked with precision instrument approach markings, that is threshold markings that distinguish runway width, touchdown zone markings, and aiming point markings, in addition to the visual runway markings.

The taxiway/taxilane system at Sierra Vista Municipal Airport is marked with yellow centerline markings.

ENROUTE NAVIGATIONAL AIDS

Navigational aids are electronic devices that transmit radio frequencies which provide direction, range and/or position information to pilots. The types of navigational aids available for aircraft flying between airports, or enroute, include the very high frequency omnidirectional range **(VOR)** facility which can also be equipped with Distance Measuring Equipment **(DME)**; nondirectional radio beacon **(NDB)**; and the global positioning system **(GPS)**.

The **VOR**, in general, provides azimuth readings to pilots of properly equipped aircraft by transmitting a radio signal at every degree to provide 360 individual navigational courses. Frequently, distance measuring equipment (DME) is combined with a VOR facility to provide distance as well as direction information to the pilot. In addition, military tactical air navigation aids (TACANs) and civil VORs are commonly combined to form a VORTAC. VORs and VORTACs can be positively identified by a series of Morse code transmissions that spell the three letter identifier.

Aircraft normally travel between airports via electronic airways, transmitted from the VOR/VORTACs. These airways are marked on aeronautical charts, connecting enroute navaids that assist pilots in controlling their aircraft along these specific routes. There are two types of airway systems: the Low Altitude System (Victor Airways) and the High Altitude Airways (Jet Routes). The Victor Airway system begins at 1,200 feet AGL and extends upward to 18,000 feet MSL. The Jet Route system, layered above the Victor Airways, begins at 18,000 feet MSL and extends upward to 45,000 feet MSL.

There are four low altitude enroute navaids (VORs) used for navigation in the vicinity of Sierra Vista/Libby AAF. Three of these have Victor Airways. Libby VOR does not. The information below includes the name of the facility, the three letter identifier, and the signal frequency.

The LIBBY VOR (FHU) is the on field facility. The frequency is 111.60 Megaherz.

The NOGALES VOR/DME (OLS) is located 27.8 nautical miles southwest of Sierra Vista Municipal Airport. The signal is intercepted on a frequency of 108.20 Megaherz.

The DOUGLAS VORTAC (DUG) is located approximately 42 nautical miles southeast of Sierra Vista Municipal Airport. The signal is intercepted on a frequency of 112.40 Megaherz.

The TUCSON VORTAC (TUS) is located approximately 42 nautical miles northwest of Sierra Vista Municipal Airport. Aircraft receive the signal on a frequency of 116.0 Megaherz.

In addition to the Victor Airways, there are three Military Training Routes. VR 263 is located approximately 10 NM southeast, VR 260 is located approximately 13 NM northwest and VR 259 is located approximately 13 NM northeast of Sierra Vista Municipal Airport/Libby Army Airfield.

The **NDB** transmits nondirectional radio signals whereby the pilots of properly equipped aircraft can determine the bearing to or from the NDB facility and then "home" or track to or from the station. Sierra Vista Municipal Airport is served by the Dragoo (DAO) NDB which is onfield.

GPS is an additional navigational aid for pilots enroute to the airport, as well as an instrument approach aid. GPS

was initially developed by the United States Department of Defense for military navigation around the world. Increasingly, over the last few years, GPS has been utilized to a greater extent in civilian aircraft. GPS uses satellites placed in orbit around the globe to transmit electronic signals which are used by properly equipped aircraft to determine altitude, speed, and navigational information. GPS allows pilots to directly navigate to any airport, eliminating the need for a specific navigational facility.

The FAA is proceeding with a program to gradually replace all traditional enroute navigational aids with GPS. Currently, Sierra Vista Municipal Airport is served by two GPS approaches to Runways 8 and 26. Discussion of these approaches is provided in the next section.

TERMINAL AREA NAVIGATIONAL AIDS

Aircraft operating on an IFR flight plan, whether in actual instrument meteorological conditions or not, are governed by IFR procedures. Most air carriers, business jets and military operations are conducted under IFR procedures. Published procedures for instrument approaches and departures outline the required flight paths and altitudes.

Terminal area navaids are those located at, or in proximity to, the airport. Navaids serve to assist the pilot on flying an appropriate direction or glidepath to the runway end completing an instrument approach. Sierra Vista Municipal Airport/Libby Army Airfield is equipped with four terminal area navaids which are available for civilian use: an Instrument Landing System (ILS), the Libby VOR, the Dragoo NDB, and Airport Surveillance Radar/Precision Approach Radar ASR/PAR).

The ILS is available for Runway 26 and is comprised of a Localizer Antenna and a Glide Slope Antenna. The Localizer Antenna provides lateral course guidance to the runway and is located at the west end of Runway 8-26. The Glide Slope antenna provides vertical guidance for aircraft during approach and landing and is located on the south side of the arrival end of Runway 26.

Both a VOR and a TACAN facility are present at Libby Army Airfield. The VOR facility is located within the triangle formed by the three runways and the TACAN facility is located on the military side of Runway 8-26. The Army is currently in the planning and design phase to relocate the VOR.

Libby Army Airfield is also equipped with a Nondirectional Beacon (NDB) which is located on the military side of Runway 8-26, between taxiways D1 and C1. A NDB is a low frequency radio beacon that pilots can use to determine their bearing from the facility. The Dragoo NDB at Libby Army Airfield has the identification code DAO. The VOR and NDB approaches are not authorized when the control tower is closed, except from operators with approved weather reporting services.

Finally, Libby Army Airfield is equipped with both Airport Surveillance Radar (ASR) and Precision Approach Radar (PAR). This equipment allows

the airport traffic controllers to provide guidance and instructions to pilots based on an aircraft's position.

Runway ends 8 and 26 are equipped with GPS approaches. The GPS approach for Runway 26 is based on the ILS approach for Runway 26. The GPS approach for Runway 8 is not based on any other approach to the runway. The GPS approach system was installed in 1999.

LANDSIDE FACILITIES

In addition, to the airside facilities described, landside facilities are essential to the daily operation of Sierra Vista Municipal Airport. Landside facilities primarily consist of those facilities required to accommodate aircraft, pilots and passengers while they are at the airport. They typically consist of terminal buildings, ground services, aircraft parking apron, hangars, fuel service, aviation related businesses, and automobile parking. Civilian landside facilities and military landside facilities that are related to civilian operations, are depicted on **Exhibit 1D, Landside Facilities**. For master planning purposes this discussion focuses on the civilian facilities only.

Terminal Building

The terminal building at Sierra Vista Municipal Airport is located north of the main runway. It is situated on the west side of the 72 acres deeded to the city for aviation purposes. The facility was expanded in 1992 to a total of 6,983 square feet. The terminal consists of airline counters, baggage handling area, security room, waiting areas, vending machines, and restroom facilities. The building layout is illustrated on **Exhibit 1E, Terminal Building Layout**.

The terminal provides space for three airline ticketing and passenger service operations. Currently, one space is used by America West (Mesa Airlines) as the sole commercial air carrier provider on field.

The terminal also provides three counters for car rental companies. Currently there are no rental car agents at the terminal. Enterprise does provide prearranged service to deplaning passengers from a location in town.

Aviation Ground Services

Double Eagle Aviation is the fixed base operator (FBO) and is located on the east side of the ramp and apron area, near Taxiway G. Double Eagle Aviation provides fueling services, major mechanical repair, parts, aircraft rental, flight instruction, charter and cargo services, and a pilots lounge. Double Eagle occupies the city owned hangar which is approximately 5,022 square feet. This building was constructed in 1993.

Apron and Aircraft Parking Areas

There are three civilian aircraft parking aprons at Sierra Vista Municipal Airport. The first apron is located south of the terminal building and is reserved for heavier aircraft. Two large-aircraft

parking spaces are delineated on this apron. The city recently expanded the apron area to the west to permit up to three additional large-aircraft parking spaces (two marked and one unmarked) for either commercial or private aircraft. A deicing facility for large and small aircraft was also constructed within the expanded apron area.

The second aircraft parking apron is located between the terminal building and the FBO hangar. It contains approximately 29 tiedown spaces.

The third aircraft parking apron is located adjacent to the FBO hangar and is reserved for transient aircraft. Approximately seven tiedowns are delineated on this apron.

A heliport area was recently constructed and is located on the east side of the FBO facility. This facility is currently utilized by Life Flight.

Hangars and Other Buildings

Hangars at Sierra Vista are located near the FBO building. There are currently forty single hangars and one double, or executive, hangar. Eight of the single hangars are larger than the others. Although not as large as typical conventional style hangars, in some observed instances, these are being used to house more than a single aircraft. The trend in aviation is towards larger hangars, where a single owner or corporation may hangar multiple aircraft, yet more privately and at less expense than by use of the executive style hangar. The FBO hangar provides additional aircraft storage space.

The offices of the Civil Air Patrol are located in three modular units that are located east of the FBO hangar.

Automobile Parking

There are three parking lots at Sierra Vista Municipal Airport: one adjacent to the terminal building, one near the hangars and local tiedowns, and one near the FBO building. The terminal building parking lot contains 249 parking spaces.

The hangar parking area is intended to provide a parking area for aircraft owners/pilots off the aircraft apron. It is marked for approximately 10 parking spaces. The FBO parking area is located outside of the fenced area and contains 17 marked spaces.

AIRPORT SUPPORT FACILITIES

Airport support facilities are those that are not classified as either airside or landside facilities, but which play an important role in the function of an airport. The airport traffic control tower (ATCT), maintenance, firefighting, fuel storage, and utilities availability at Sierra Vista Municipal Airport are five support facilities which are described below.

00MP06-1D-6/26/02

LEGEND :

- Existing Property Line
- Building Restriction Line (BRL)

FACILITIES :

1. Terminal Building
2. Fixed Base Operation (FBO) Hangar
3. Civilian Hangars
4. Small Aircraft Wash Rack
5. Above Ground Fuel Storage Facility
6. Water Storage/Pump Station
7. Civil Air Patrol
8. Auto Parking
9. Aircraft Tiedowns
10. Water Well/Pumping Station
11. Large Aircraft Apron
12. Large Aircraft Wash Rack & Deicing Station

Property Line
90
To Sierra Vista
Airport Avenue
BRL
Helipad
Twy `K`
Twy `J`
Twy `G`
Twy `G`
Rwy 12-30
Windsock
AWOS
Arresting Gear
Runway 8-26
12,000' x 150'
NORTH
0
300
600
SCALE IN FEET
municipal airport

Exhibit 1D
EXISTING LANDSIDE FACILITIES

00MP06-1E-7/18/00

Exhibit 1E
TERMINAL BUILDING

Airport Traffic Control Tower

The Airport Traffic Control Tower (ATCT) at Libby Army Airfield/Sierra Vista Municipal Airport is located on the military side of the airfield. The tower is maintained and operated by the U.S. Army. It is equipped to provide Precision Approach Radar (PAR) service to pilots. The ATCT currently operates from 7:00 a.m. to 4:00 p.m., Monday through Friday and occasionally operates on weekends to accommodate special military operations.

Maintenance

Through its Department of Public Works, the City of Sierra Vista provides maintenance support for the civilian aircraft ramp and land facilities at Sierra Vista Municipal Airport. The airfield facilities are maintained by the U.S. Army at Libby Army Airfield.

Firefighting

Aircraft Rescue and Firefighting (ARFF) facilities are provided by the U.S. Army and are located on the south side of the airfield. This ARFF houses the emergency fire suppression equipment for the airfield and provides the initial response to any aircraft fires. It is supported by the city of Sierra Vista Fire Department and Fort Huachuca, depending on the location of the incident. According to the August 2000, *Airport/Facility Directory*, the ARFF meets the requirements of an Index A facility.

The Fort is considering being designated as a deployment site, which would allow them to bring in charter aircraft to transport personnel. Per the air carrier, the ARFF Index would need to be improved to accommodate a Boeing 747 or DC-10 aircraft.

Fuel Storage Facilities

Fuel storage at Sierra Vista Municipal Airport consists of four 15,000-gallon above ground fuel tanks, for a total of 60,000-gallon storage capacity. Two of the 15,000-gallon tanks contain Jet A fuel and the remaining two 15,000-gallon tanks contain 100LL Avgas. The city distributes the fuel using two trucks: a 3,200-gallon capacity truck containing Jet A and 1,200-gallon capacity truck containing Avgas. Additional trucks are used during the local forest fire season to support USFS operations.

Automated Weather Observing System

An Automated Weather Observing System (AWOS-3) is located at Libby Army Airfield. The AWOS-3 provides automated aviation weather observations 24-hours-a-day. The system updates weather observations every minute, continuously reporting significant weather changes as they occur. The AWOS system reports sky

observations, cloud ceiling, visibility, temperature, dew point, wind direction and speed, altimeter setting, and density altitude. This system is located on the east end of the airfield, north of Runway 26 and south of Taxiway G.

Utilities

The availability of utilities serving Sierra Vista Municipal Airport is an important factor in determining the development potential of airport property. Of primary interest in the area of the airport is the availability of water, sanitary sewer, electricity, and storm sewer. Also of concern is the disposal of solid waste and its proximity to the runway; these facilities have the propensity to attract wildlife which create a hazard for aircraft.

Utilities at Sierra Vista Municipal Airport are as follows:

Water – Potable water to the airport is provided via an on-site, city-owned well. The well, related pumphouse and 60,000-gallon storage tank are located on the east side of the hangars, north of the FBO hangar. An additional well is located north of the terminal parking lot. No water storage is associated with this particular well. The water supply system for the civilian side of the airfield is separate from that of the military side.

Sanitary Sewer – The terminal building and the FBO building are connected to individual sewage disposal systems. There is currently no municipal sewer service to Sierra Vista Municipal Airport.

Electricity – The Sulphur Springs Valley Electrical Cooperative provides electrical power to Sierra Vista Municipal Airport. Tucson Electric Power provides electricity to Libby Army Airfield.

Gas – Southwest Gas provides natural gas to the civilian airport complex through a 2-inch gas line constructed along the southern side of the airport access road.

Solid Waste – The city of Sierra Vista provides solid waste disposal services for the airport. Waste is taken to an enclosed transfer station located approximately 8.5 miles east of the airfield for transport to the County landfill.

AIRSPACE STRUCTURE AND AIR TRAFFIC CONTROL

The FAA Act of 1958 established the FAA as the agency responsible for the control and use of navigable airspace within the United States. The FAA has established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe and efficient airspace environment for civil, commercial, and military aviation. The NAS is defined as the common network of U.S. airspace, including air navigation facilities; airports and landing areas;

aeronautical charts; associated rules, regulations and procedures; technical information; personnel and material. System components shared jointly with the military are also included.

AIRSPACE STRUCTURE

To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the National Airspace System. The U.S. airspace structure provides for categories of airspace and identifies them as Classes A, B, C, D, E, and G. **Exhibit 1F, Airspace Classification** graphically illustrates these classes.

Class A airspace is high level controlled airspace and includes all airspace from 18,000 feet MSL to Flight Level 600 (approximately 60,000 feet MSL). Class B airspace is controlled airspace surrounding high activity commercial service airports (i.e. Phoenix Sky Harbor International Airport). Class C airspace is controlled airspace surrounding lower activity commercial service and some military airports. Class D airspace is controlled airspace surrounding low activity commercial service and general aviation airports with an airport traffic control tower (ATCT), such as at Sierra Vista Municipal Airport.

All aircraft operating within Class A, B, C, and D airspace must be in constant contact with the air traffic control facility responsible for the particular airspace. Class E airspace is controlled airspace that encompasses all instrument approach procedures and low altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with air traffic control when operating in Class E airspace. Class G airspace is uncontrolled airspace. Airspace in the vicinity of Sierra Vista Municipal Airport is depicted on **Exhibit 1C, Regional Airspace,** as referenced from the Phoenix Sectional Air Chart, May 2000.

Sierra Vista Municipal Airport/Libby Army Airfield is located within Class D Airspace. This area includes that airspace within a horizontal radius of 4.3 statute miles of the airport, extending from the surface up to 7,200 feet MSL. Aircraft operating in this airspace are required to contact the ATCT prior to entering. During the times the ATCT is closed, the airspace reverts to Class G Airspace (uncontrolled).

In addition to the designated Class D Airspace at Sierra Vista Municipal Airport/Libby Army Airfield, a Class E Airspace extension has been designated. This Class E Airspace on the east side of the designated Class D Airspace provides additional controlled airspace which contains the instrument approach procedures into the Airport.

Restricted Areas

Restricted areas contain airspace identified by an area on the surface of

the earth within which the flight of aircraft, while not wholly prohibited, is subject to restrictions. Activities within these areas, such as artillery firing, aerial gunnery, or guided missiles, must be confined because of their nature. Limitations to aircraft operations may be imposed on those aircraft that are not part of these activities.

If the Restricted Area is active, the ATC facility having jurisdiction over the airspace needs to authorize clearances to aircraft that cannot avoid the restricted area, unless the aircraft is on a previously approved altitude reservation mission or is part of the activity within the restricted area. Penetration of Restricted Areas without authorization from the controlling agency may be extremely hazardous to the aircraft and could result in the loss of the pilot's operating certificate. If the Restricted Area is not active and has been released to the controlling agency (FAA), the ATC facility will allow aircraft to transition through the airspace without issuing special clearances.

Three Restricted Areas (R-2303A, R-2303B, and R-2312) are located in the vicinity of Sierra Vista Municipal Airport. Restricted Area R-2303A, under the jurisdiction of Albuquerque ARTCC, includes the airspace from the surface up to 15,000 feet MSL and is active from 7:00 a.m. to 4:00 p.m., Monday through Saturday. Restricted Area R-2303B is similar to R-2303A, except that the airspace included in R-2303B is from 15,000 feet MSL to 45,000 feet MSL (Flight Level 450). Restricted Area R-2312, under the jurisdiction of the Libby Army Airfield ATCT, includes the airspace from the surface up to 15,000 feet MSL and is active continuously.

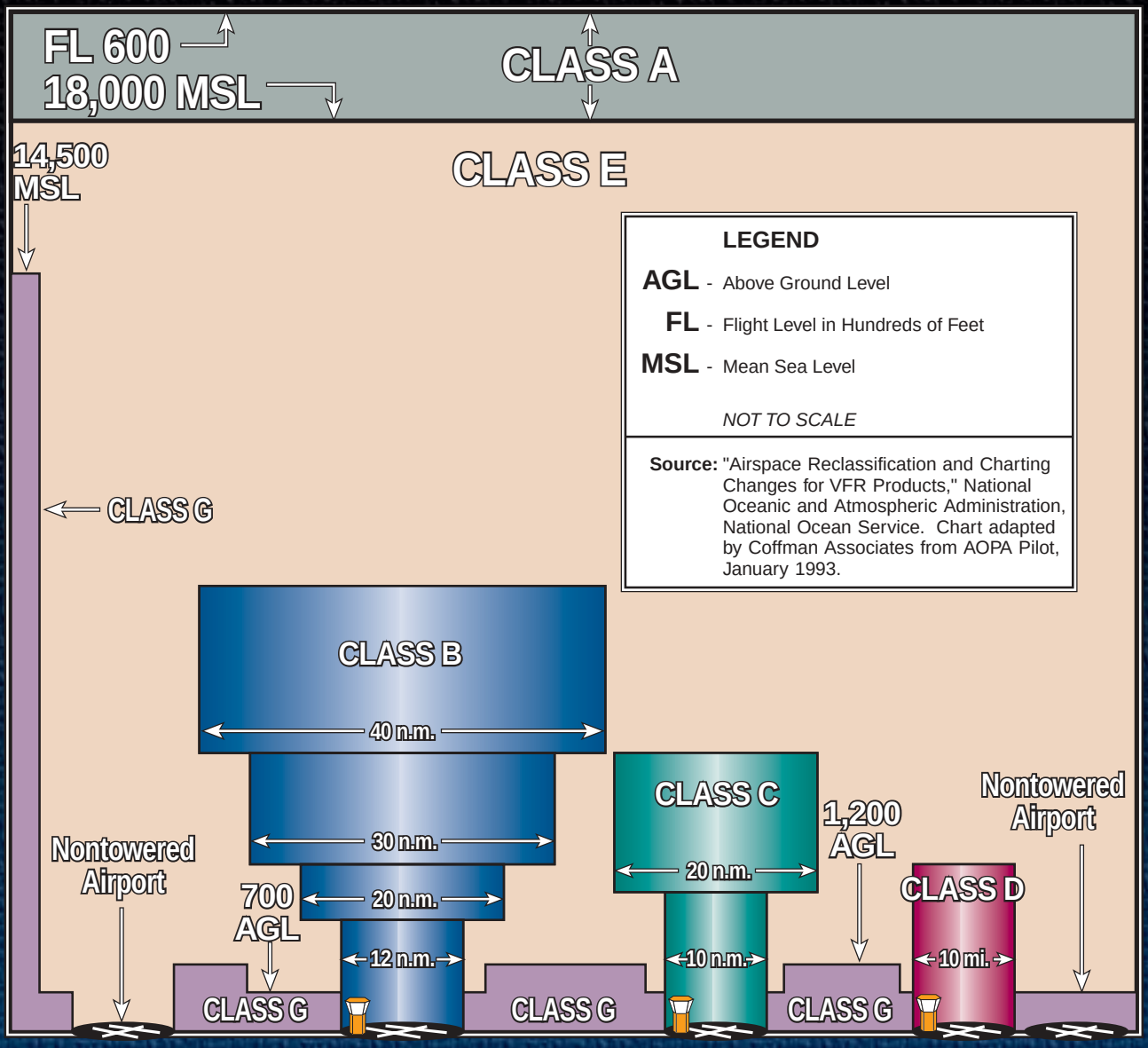
Restricted Area, R-2303A, was modified to exclude the airspace from the surface to 7,000 feet MSL within a 3 NM radius of the airport and within 1 NM on either side of State Road (SR) 90. This modification results in an unrestricted, VFR route into and out of the airport.

Military Operating Areas

Military Operating Areas (MOAs) contain airspace, as defined by vertical and lateral limits, for the purpose of separating certain military training activities from instrument flight rule (IFR) traffic - typically jets. When an MOA is being used by the military, nonparticipating IFR traffic must be cleared through the area. Cleared air traffic must maintain the minimum separation assigned by the ATC facility having jurisdiction within the area.

There are four MOAs located in the general vicinity of Sierra Vista Municipal Airport. The Tombstone C MOA is located 16 NM east, the Tombstone A MOA is located 24 NM northeast, and both the Ruby 1 MOA and Fuzzy MOA are located 38 NM west of the airport. None of these MOAs directly influence the operations into or out of Sierra Vista Municipal Airport.

00MP06-1F-12/6/00



CLASSIFICATION	DEFINITION
CLASS A	Generally airspace above 18,000 feet MSL up to and including FL 600 .
CLASS B	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports.
CLASS C	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control.
CLASS D	Generally airspace from the surface to 2,500 feet AGL sourrounding towered airports.
CLASS E	Generally controlled airspace that is not Class A, Class B, Class C, or Class D.
CLASS G	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E.

Sierra Vista municipal airport

Exhibit 1F
AIRSPACE CLASSIFICATION

Fifteen miles south of the southern edge of the seven mile radius of the Sierra Vista Municipal Airport control area is the US Air Defense Identification Zone (ADIZ), a continuous zone for control of United States boundaries.

Instrument Approach Procedures

Flights in and out of Sierra Vista Municipal Airport/Libby Army Airfield are currently conducted using both Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) conditions. VFR conditions exist when flight visibility is three miles or greater and the cloud ceiling is at least 1,000 feet above the surface. IFR conditions exist when visibility or cloud levels are reduced below VFR conditions. Libby Army Airfield has an ATCT providing all necessary communications and navigational assistance to pilots operating in and out of the airport. Enroute Air Traffic Control (ATC) services are provided by Albuquerque Air Route Traffic Control Center (ARTCC).

Aircraft following instrument flight rules (IFR) are required to follow instructions from Libby Approach Control, operated on field. Approach Control then handles the aircraft, giving instrument approach instructions. Details of the published instrument approaches for Sierra Vista Municipal Airport are provided in **Table 1D**, Instrument Approach Data. When the visibility and cloud ceilings deteriorate to a point where visual flight can no longer be conducted, aircraft must follow published instrument approach procedures to locate and land at the airport.

The different minimum requirements for visibility and cloud ceilings are varied dependent on the approach speed of the aircraft. These are noted by Category type: A - 0-90 knots, B - 91-121 knots, C - 121-140 knots, D - 141-165 knots, or E - above 165 knots. As mentioned there are currently five published instrument approaches to the Sierra Vista Municipal/Libby Army Airfield: GPS Runways 8 and 26, ILS Runway 26, VOR Runway 26, NDB Runway 26.

The ILS Runway 26 approach provides the airport with the lowest approach visibility minimums. Utilizing this approach, a properly equipped aircraft and pilot can land at the airport with 200-foot cloud ceilings and three fourths mile visibility for aircraft categories A, B, C, and D. These and the approach minimums for the other four approaches are shown on **Table 1D**.

Instrument Departure Procedures

Aircraft departing the Sierra Vista Municipal Airport using instrument flight rules are required to contact and receive instruction from Libby Departure Control for take-off. An aircraft would, then, fly assigned headings and altitudes. Ultimately the aircraft is "handed off" to the Air Route Traffic Control Center with authority

over that flight sector. Albuquerque is the ARTCC for FHU.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC)

The FAA has established 21 Air Route Traffic Control Centers (ARTCC) in the continental United States to control aircraft operating under instrument flight rules (IFR) within controlled airspace on the enroute phase of flight. An ARTCC assigns specific routes and altitudes along federal airways to maintain separation and orderly air traffic flow.

TABLE 1D
Instrument Approach Data
Sierra Vista Municipal/Libby AAF

	WEATHER MINIMUMS BY AIRCRAFT TYPE					
	Category A/B		Category C		Category D	
	Ceiling	Vis	Ceiling	Vis	Ceiling	Vis
ILS RUNWAY 26 APPROACH						
Straight-In ILS Only	200	0.75	200	0.75	200	0.75
Straight-In Localizer Only	300	1	300	1	300	1
Circling	500	1	500	1.5	600	2
VOR RUNWAY 26 APPROACH						
Straight-In	500	1	500	1.5	500	1.75
Circling	500	1	500	1.5	600	2
GPS RUNWAY 26 APPROACH						
Straight-In	300	1	300	1	300	1.25
Circling	500	1	500	1.5	600	2
NDB RUNWAY 26 APPROACH						
Straight-In	600	1	600	1.5	600	1.75
Circling	600	1	600	1.5	600	2
GPS RUNWAY 8 APPROACH						
Straight-In	700	1	700	1.75	D - 700 E - 700	2 2.25
Circling	800	1	800	2	D - 700 E - 700	2 2.25

Aircraft Categories are established based on 1.3 times the stall speed in landing configuration as follows:

- Category A/B 0-120 knots
- Category C 121-140 knots
- Category D 141-165 knots
- Category E abv 165 knots

Ceiling -Cloud Height (in feet above ground level)
Vis - Visibility (in miles)

Centers use radio communication and long range radar with automatic tracking capability to provide enroute air traffic services. Typically, the ARTCC splits its airspace into sectors and assigns a controller or team of controllers to each sector. As an aircraft travels through the ARTCC, one "hands off" control to another. Each sector guides the aircraft using discrete radio frequencies. Albuquerque ARTCC is responsible for enroute control of all aircraft operating under IFR and arriving and departing the airspace.

AREA LAND USE AND ZONING

EXISTING ZONING/LAND USE

Sierra Vista Municipal Airport is surrounded by the Fort Huachuca Military Reservation. Lands surrounding Fort Huachuca are subject to Cochise County, Santa Cruz County, and the City of Sierra Vista land use restrictions.

Land around the airport is primarily undeveloped, with the exception of the military facilities located directly south of the airfield. The Libby Army Airfield and Sierra Vista Municipal Airport are located within the Fort Huachuca Military Reservation.

The City of Sierra Vista owns and has zoned the 72 acres of the airport property deeded to it as Light Industrial. The area of Fort Huachuca is zoned as Military Reservation. The additional 203 acres, proposed for transfer, has been conditionally re-zoned as Light Industrial by the City of Sierra Vista. The conditional re-zoning of the property will become effective at the time a deed is recorded transferring the title of the property from Fort Huachuca to the city.

In addition, the city has adopted an Airport Airspace Overlay Zone which is intended to regulate and restrict the height of structures and objects of natural growth in the vicinity of airports and heliports. Building and object height is limited in accordance with military design guidelines and Federal Aviation Regulation Part 77, *Objects Affecting Navigable Airspace*, related to public-use airports.

FUTURE LAND USE

According to the Sierra Vista General Plan, *Vista 2010*, the Sierra Vista Municipal Airport's current land use designation is Industrial. The 203-acre area has no current Sierra Vista land use designation. **Exhibit 1G**, Existing Land Use, depicts these land parcels. The city does not provide for any future land use designations for federally owned and controlled property and these properties are not identified in *Vista 2010*. Once the 203 acres have been transferred to the city of Sierra Vista and shown as airport property, this tract will then have a land use designation of Industrial.

Land use is important to the existing and potential needs of the airport. By understanding the land use issues surrounding the airport, more appropriate recommendations can be made for the future.

SOCIOECONOMIC CHARACTERISTICS

A variety of historical and forecast socioeconomic data, related to the City of Sierra Vista and Cochise County was collected for use in various elements of this master plan. This information is essential in determining aviation service level requirements, as well as forecasting the number of based aircraft and aircraft activity at the airport. Aviation forecasts are normally related to the population base, economic strength of the region, and the ability of the region to sustain a strong economic base over an extended period of time.

POPULATION

Airports are support facilities to the cities and regions that they serve. Therefore, the population and economic structure of the attending communities are critical factors to consider when planning airport facilities. In this section consideration will given to the City of Sierra Vista, the Sierra Vista SE CDP, and Cochise County, Arizona as compared with the state of Arizona with respect to population. (Sierra Vista SE CDP is an area defined by the Arizona Department of Economic Security for statistical purposes.)

Population data presented in **Table 1E Historical Population** was obtained from the *Market Assessment Report, Part I*, Sunregion, Associates, June 2000 and the Arizona Department of Economic Security, July 1999.

TABLE 1E
Historical Population

Year	State of Arizona	Cochise County	City of Sierra Vista	Sierra Vista SE CDP
Historical Population				
1980[1]	2,718,215	85,686	24,937	n/a
1990[1]	3,665,228	97,624	32,983	9,237
1998[2]	4,764,025	118,412	39,995	11,254

Notes: [1] U.S. Bureau of the Census; 1990 is from *Summary Tape File 1A, Arizona*.
[2] Arizona Department of Economic Security, December 1998.
Source: *Market Assessment Report, Part I,* Sunregion Associates, June 2000.

From 1980 to 1998, the City of Sierra Vista's population increased by over 15,000 residents, from 24,937 to an estimated 39,995. The annual population growth rate in Sierra Vista slowed from 2.8 percent from 1980-

00MP06-1G-12/6/00

SAN IGNACIO DEL BABOCOMARI
(Land Grant)

Huachuca
City

90

FORT HUACHUCA MILITARY RESERVATION

LIBBY ARMY AIRFIELD/
SIERRA VISTA
MUNICIPAL AIRPORT

203 Acre
Transfer
(Pending)

LEGEND:

- City of Sierra Vista
- Fort Huachuca Military Reservation
- Residential
- Commercial
- Public
- Industrial
- Open Space
- School

East
Gate

CARTER ST

HIGHWAY 90 (BYPASS)

West
Gate

827

HATFIELBD

MAIN POST

GARDENAVE

Main
Gate
RD

FRY BLVD

SMITH AVE

RAILROAD AVE

WINROW

BUFFALO SOLDIER TRAIL

SIERRA VISTA

SEVENTH ST

CORONADO RD

92

FORT HUACHUCA MILITARY RESERVATION

Coronado
National
Forest

0 4000 8000
SCALE IN FEET

NORTH

COCHISE

AVENIDA

municipal
airport

Exhibit 1G
EXISTING LAND USE

1990, to approximately 2.4 percent from 1990-1998. During the same period the County's annual growth rate rose from 1.3 percent in the 1980-1990 period, to 2.4 percent for the period 1990-1998.

EMPLOYMENT

Table 1F, Occupational Distribution, 1990, provides information regarding the breakdown of employment in Sierra Vista by industrial sector. In 1990, the city of Sierra Vista had nearly 67 percent of its work force in the executive, administrative, managerial, professional, technical and related, as well as sales and administrative support occupations, compared with 57.5 percent in Cochise County, and 60.1 percent in Arizona. The balance of the employed, or about 33 percent, were in the following occupations; precision production; craftsmen and repair; machine operators and related; transportation related; handlers and related; and, laborers.

TABLE 1F
Occupational Distribution, 1990
(Employed, 16 Years and Over)

	Percent of Total		
Occupation	**State of Arizona**	**Cochise County**	**City of Sierra Vista**
Executive, Administrative, & Managerial	12.6	11.4	14.5
Professional Speciality Occupations	14.3	15.4	18.4
Technicians and Related Support Occupations	4.0	3.7	5.2
Sales Occupations	12.9	11.5	12.0
Administrative Support	16.3	15.5	16.7
Private Household	0.4	0.5	0.5
Protective Services	2.0	3.5	2.4
Service Occupations	12.3	14.1	13.2
Farming, Forestry & Fishing Occupations	2.3	3.5	2.4
Precision Production, Craftsmen, and Repair Occupations	11.4	10.9	7.8
Machine Operators, Assemblers, and Inspectors	4.3	2.7	2.1
Transportation and Materials Moving	3.6	3.5	3.0
Handlers, Equipment Cleaners, Helpers, & Laborers	3.6	3.8	3.1
Total	**100.0**	**100.0**	**100.0**

Source: *Market Assessment Report, Part I,* Sunregion Associates, June 2000.

The largest percentage of Sierra Vista's workforce (18.4 percent) was employed in a variety of professional specialty occupations, followed by employment in executive, administrative and managerial positions (14.5 percent).

According to the *City of Sierra Vista Silhouettes: A Statistical Profile*, the largest employer in the city is Fort Huachuca. The Fort's population has remained steady since 1994. Data from the Directorate of Resource Management at Fort Huachuca indicates that there were 10,362 military and civilian employees in 1998. Of these employees 5,421 were military (4,310 were employed at the base and 1,111 personnel were students at the base). Other major employers are the Sierra Vista School District, Cochise Community College, Science Application International, and Sierra Vista Community Hospital. These are followed by the city of Sierra Vista, SCITEK, and KE&G Construction.

PER CAPITA PERSONAL INCOME

Table 1G, Per Capita Personal Income (PCPI), compares the per capita personal income (adjusted to $1992) for the Cochise County, the state of Arizona, and the United States between 1970 and 1999.

As illustrated by the table, the state of Arizona's PCPI has mirrored, but slightly trailed that of the United States. The average annual growth rate of Arizona's adjusted PCPI over the twenty nine year period was 1.64 percent, while the nation's adjusted PCPI averaged 1.90 percent annual growth.

The percent increase in growth of PCPI for Cochise County was lower than the other two comparative PCPIs. The personal per capita income in 1970 was an average of $11,673 compared to the 1999 average income of $15,458, annual average increase of 0.97 percent. This lags behind the state and national averages by 0.67 and 0.93 percent, respectively.

TABLE 1G
Adjusted Per Capita Personal Income

	1970	1980	1990	1999	Percent Annual Increase
Cochise County	$11,673	$12,264	$13,853	$15,458	0.97%
State of Arizona	$12,905	$16,013	$17,875	$20,673	1.64%
United States	$13,812	$17,203	$20,652	$23,811	1.90%

Source: CEDDS, Woods and Poole (1999)

SUMMARY

The information discussed on the previous pages provides a framework for the remaining elements of the Airport Master Planning process. Information on current airport facilities, their utilization, and conditions will serve as a basis, with additional analysis and data collection, for the development of forecasts of aviation activity, and facility requirement determinations.

DOCUMENT SOURCES

A variety of different documents were referenced in the inventory process. The following listing reflects a partial compilation of these sources. The listing does not include the data provided directly by the very helpful staff at Sierra Vista Airport, or airport drawings which were referenced for information. An on-site inventory was also used to review the conditions of facilities for the master planning effort.

Airport Facility Directory, Southwest U.S., U.S. Department of Commerce, National Oceanic and Atmospheric Administration, April 20,2000 Edition.

The Complete Economic and Demographic Data Source (CEDDS) Woods and Poole Economics, 2000.

Market Assessment Report, Sunregion Associates, June, 2000.

National Plan of Integrated Airport System (NPIAS), US Department of Transportation, Federal Aviation Administration, 1994-1998.

Preliminary Draft Environmental Assessment for the Transfer and Development of 203 Acres of Property, August 2000.

Phoenix Sectional Aeronautical Chart, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, May 2000.

Sierra Vista Airport Master Plan; City of Comprehensive Plan, Updated 1995.

Sierra Vista Economic Development Corporation

FAA Terminal Area Forecast System Reports, December 1999.

U.S. Terminal Procedures, Southwest Volume 1 of 2, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 10 August, 2000 Edition.

The following Web pages were also visited for information during the preparation of the inventory:
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FAA 5010 Data, Area Airports
http://www.airnav.com/
http://www.nasao.org/
FAA Information
http://www.gcrl.com/

City of Sierra Vista website
http://www.arizonaguide.com:80/cities/sierravista/index.html

Sierra Vista Chamber of Commerce
http://209.130.28.55/ChamberBiz-Sierra Vista